

APPENDIX A

SAMPLING AND ANALYSIS PLAN

Former ORP / Building 1 Area

Former Oakland Army Base - EDC Area, Oakland, California

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1. INTRODUCTION

This Sampling and Analysis Plan (“SAP”) has been prepared by Erler & Kalinowski, Inc. (“EKI”) on behalf of OBRA to establish procedures that will be used by the Contractor to collect and analyze environmental samples during environmental remediation activities at the Former ORP / Building 1 Area. A California registered geologist or professional civil engineer, or an appropriately trained geologist or engineer working under the supervision of one of these registered professionals, will implement this SAP. If needed, the Contractor may retain an experienced subconsultant to provide professional sample collection services and to coordinate laboratory analyses. All environmental samples will be analyzed by a local, Oakland Base Reuse Authority (“OBRA”)-approved, State of California-certified analytical laboratory. Upon receipt of laboratory analytical results, the Contractor will provide copies of the results, chain of custody forms, and appropriate related information, including topographic survey coordinates and sketches defining sample locations, to the Client Representative for review in a timely manner in accordance with the Contract Documents.

This SAP describes the required minimum sample collection frequencies, types of laboratory analyses, and protocols for collecting and analyzing the following types of samples:

- samples of Organic Residue for identification of Building 1 Remediation Waste;
- samples of pre-treated and post-treated Building 1 Remediation Waste for compliance with the Land Disposal Requirements Variance;
- samples of stockpiled excavated Overburden for potential on-site reuse;
- samples of stockpile excavated Stained and Oily Soil for waste profiling and off-Site disposal;
- samples of soil from excavation sidewalls to confirm Remediation Goals have been achieved;
- samples of potential import fill sources proposed by the Contractor;

Other environmental sampling and analysis of soil or debris encountered during remediation activities may also be required to characterize materials for disposal purposes. The required sampling frequencies and laboratory analyses for waste disposal purposes will be determined by the Contractor in consultation with the selected disposal facilities, as needed to obtain waste acceptance at the appropriately permitted disposal facilities and for completion of any required waste profile forms or hazardous waste manifests.

Field methods, sample collection procedures, sampling equipment decontamination requirements, sample handling and documentation requirements, sample identification methods, minimum numbers and types of Quality Assurance / Quality Control (“QA/QC”) samples, and other QA/QC related requirements are described in the Site-Wide Quality Assurance Project Plan (“QAPP”) (Veridian, 2005). This information is not repeated in this SAP but is incorporated by reference.

The Contractor is required to prepare a detailed Perimeter Air Monitoring Plan in accordance with the Contract Documents and the Perimeter Air Monitoring Plan Requirements in Appendix G. The Perimeter Air Monitoring Plan will describe the sample frequencies, analyses, and procedures that will be used by the Contractor for perimeter air monitoring for fugitive dust, air sampling for lead and hydrogen sulfide, and air sample analysis during excavation activities; therefore, air sampling and analysis are not discussed in this appendix.

2. ORGANIC RESIDUE SAMPLING FOR IDENTIFICATION OF BUILDING 1 REMEDIATION WASTE

The Contractor will sample and analyze stockpiled Organic Residue for identification of Building 1 Remediation Waste at a frequency of, at least, 1 representative sample per 200 cubic yard stockpile. From each 200 cubic yard stockpile or delineated 200 cubic yard stockpile segment of Organic Residue, the Contractor will collect four discrete samples at random locations and depths in accordance with the soil sampling procedures described in the QAPP (Veridian, 2005). A four-point composite representative sample will be formed from the four discrete samples. Compositing of samples will be performed in the laboratory.

It is anticipated that the Organic Residue stockpiles will be heterogeneous in nature and will include only a small portion of Overburden or underlying clayey and sandy sediments that is inadvertently included with Organic Residue during excavation. If the majority of the stockpile is visibly Organic Residue with only occasional soil or sediments, the Contractor will use its best efforts to collect discrete samples that are representative of the Organic Residue and to not include large fractions of soil. However, if the Contractor is unable to segregate the Organic Residue from surrounding soil during excavation using reasonable efforts, the resulting Organic Residue stockpile will likely contain a significant portion of soil mixed with the Organic Residue. In this latter situation, the Contractor will collect representative samples of stockpiled material that includes both Organic Residue and soil, in approximate proportion to their relative distribution visible in the stockpile. The Contractor will perform stockpile sampling activities only after notifying the Client Representative. All sampling activities will be observable by the Client Representative at all times in accordance with the Contract Documents.

The representative composite samples of Organic Residue will be analyzed by the following U.S. EPA analytical methods:

- Lead by U.S. EPA Method 6020 in Toxicity Characteristic Leaching Procedure (“TCLP”) extract using TCLP Method 1311 provided in Test Methods for Evaluation Solid Waste, SW-846 (“SW-846”); and
- pH by United States Environmental Protection Agency (“U.S. EPA”) Method 9045.

The Client Representative will review the analytical results and confirm identification of each 200 cubic yard stockpile or stockpile segment that is to be managed as Building 1 Remediation Waste, based on the criteria defined in the Land Disposal Restriction (“LDR”) Variance (U.S. EPA, 2002), i.e., any material in the former ORP / Building 1 area that displays the D008 toxicity characteristic for lead (TCLP lead greater than 5 mg/L) or material that displays the D002 corrosivity characteristic (pH less than 2). Following receipt of all completed, certified laboratory analytical reports for a particular stockpile or delineated stockpile segment, the Client Representative will have two working days to review the data prior to notifying the Contractor of the results of the review.

3. BUILDING 1 REMEDIATION WASTE SAMPLING

Once samples have been collected to identify Building 1 Remediation Waste, as described above, the Building 1 Remediation Waste will be treated by the Contractor. Each “Treatment Batch Volume” will not exceed 200 cubic yards; smaller volumes may be necessary to achieve and demonstrate adequate treatment in conformance with the Alternative Treatment Standard (“ATS”). Smaller Treatment Batch Volumes may also be needed based on observations of the waste heterogeneity and the effectiveness of the waste-reagent mixing process.

3.1 PRE-TREATMENT SAMPLING

The Contractor will be required to sample and analyze pre-treatment samples of Building 1 Remediation Waste at a frequency of at least one representative sample per Treatment Batch Volume. If allowable sample holding times are not violated and the Treatment Batch Volume consists entirely of one of the same stockpiles sampled and analyzed for initial waste identification in accordance with the protocols identified in Section 2 above, the representative stockpile samples for collected for waste identification may be used for any further laboratory analyses required in this Section 3.1. If new pre-treatment samples are needed, the representative samples will be collected as follows:

- If the treatment process proposed by the Contractor in the Soil Treatment Process Plan is a continuous process, then the Contractor will collect four discrete samples from pre-treated Building 1 Remediation Waste stream as it enters the treatment unit at approximately equally spaced time intervals over the time period that it takes to treat a Treatment Batch Volume. The representative sample will be formed by compositing the four discrete samples into one sample in the laboratory.
- If the treatment process proposed by the Contractor in the Soil Treatment Process Plan requires a Treatment Batch Volume of 200 cubic yards or less, then the Contractor will collect four discrete samples per Treatment Batch Volume. The representative sample will be formed by compositing the four discrete samples into one sample in the laboratory.
- All pre-treatment samples of stockpiled Organic Residue will follow the protocols described in Section 2 above to assure representative sampling of any visible mixed wastes.

The Contractor will analyze pre-treatment samples only if the treatment process is unable to reduce the TCLP lead concentrations in the treated Building 1 Remediation Waste to less than 5 mg/L, as determined by post-treatment sampling described below in Section 3.2. In this case, TCLP lead data from pre-treatment samples will be needed by the Contractor to demonstrate that the Alternative Treatment Standard (“ATS”) of, at least, 77% percent reduction in TCLP lead concentrations was achieved by the Contractor’s on-site treatment.

The Contractor may be allowed to adjust the sampling frequency of pre-treatment sampling based upon the level of consistency of performance observed in the treatment of Building 1 Remediation Waste, in accordance with *Notice of Decision to Approve a Site-Specific Treatment Variance from Land Disposal Restriction Treatment Standards for Hazardous Wastes 40 CFR § 268.44 (h)*, dated 15 July 2002 (U.S. EPA, 2002). Any such adjustments in sampling protocols that propose less frequent or otherwise less conservative approaches than those that are specified in the Contractor’s approved Soil Treatment Process Plan will be implemented by Contractor only after written approval from both the Client Representative and DTSC in accordance with the Contract Documents. Any such adjustments in sampling protocols that propose more frequent or otherwise more conservative approaches than those that are specified in the Contractor’s approved Soil Treatment Process Plan may be implemented by Contractor only after written approval from the Client Representative in accordance with the Contract Documents. DTSC will be informed of changes that are more conservative/frequent than originally proposed within 48 hours of Client Representative’s approval of these changes.

3.2 POST-TREATMENT SAMPLING

The Contractor will collect post-treatment samples of Building 1 Remediation Waste at a frequency of one composite sample per Treatment Batch Volume. Each representative sample will be formed by compositing the samples in the laboratory from four discrete samples obtained by the Contractor from the Treatment Batch Volume. The Contractor’s Soil Treatment Process Plan will dictate how the Contractor will collect the discrete samples, i.e., either at random locations from treated stockpiles, or from the stream of treated material exiting the treatment unit at equally spaced time intervals over the time period need to treat one Treatment Batch Volume, as discussed above in Sections 2 and 3.1.

Post-treatment samples of Building 1 Remediation Waste will be analyzed by the following analytical methods:

- Lead by U.S. EPA Method 6020 in TCLP extract using TCLP Method 1311 provided in SW-846;
- pH by U.S. EPA Method 9045; and
- Moisture content by American Society of Testing and Materials (“ASTM”) method D2216.

The Contractor may adjust the sampling frequency of post-treatment sampling based upon the level of consistency of performance observed in the stabilization of Building 1 Remediation Waste, in accordance with *Notice of Decision to Approve a Site-Specific Treatment Variance from Land Disposal Restriction Treatment Standards for Hazardous Wastes 40 CFR § 268.44 (h)*, dated 15 July 2002 (U.S. EPA, 2002). Any such adjustments in sampling protocols will be implemented by Contractor only after written approval from the Client Representative in accordance with the Contract Documents.

3.3 ADDITIONAL WASTE TESTING PRIOR TO OFF-SITE DISPOSAL

Additional characterization of treated Building 1 Remediation Waste by the Contractor may be necessary to meet the selected disposal facility’s waste profiling and waste acceptance criteria, e.g., flammability testing. The Contractor will be responsible for coordinating and determining all necessary and required additional waste characterization requirements with the selected disposal facility and for performing any and all additional landfill-required waste characterization to allow off-Site disposal in accordance with the prices provided in the Contractor’s bid.

3.4 PROVISION OF DATA TO CLIENT REPRESENTATIVE

For all treated Building 1 Remediation Waste prior to shipment for off-Site disposal, the Contractor will provide copies of all analytical data and additional landfill-required waste characterization information to the Client Representative, including proposed or completed waste profile forms, LDR notification forms, waste manifests, and any bills of lading in a timely manner, in accordance with the Contract Documents. Based on the analytical data provided by the Contractor for each Treatment Batch Volume, the Client Representative will determine if treated Building 1 Remediation Waste meets the ATS or if a Treatment Batch Volume requires additional treatment to meet the ATS. Following receipt of all complete, certified laboratory analytical reports for a particular treated stockpile or delineated stockpile segment, the Client Representative will notify the Contractor within two working days of receiving data from the Contractor a) if a

particular Treatment Batch Volume requires additional testing or additional treatment to meet the ATS, or b) that the particular Treatment Batch Volume can be transported to the OBRA-approved, RCRA Subtitle C landfill as either RCRA hazardous waste or non-RCRA hazardous waste.

4. OVERBURDEN SAMPLING

During environmental remediation activities, the Contractor will segregate Overburden from Organic Residue, Stained and Oily Soil, underlying clayey and sandy sediments, and debris. The Overburden will be stockpiled on-site in a designated location for further characterization by the Contractor to determine whether it is acceptable for on-site reuse as backfill in the excavation.

4.1 SAMPLING FREQUENCY

4.1.1 Previous Sampling of Overburden

A total of seventeen in-situ Overburden samples were previously collected and analyzed from the area within the Base Case Excavation limits indicated on Figure 3, which is equivalent to approximately one sample per 450 cubic yards of Overburden within the Base Case Excavation. These Overburden samples were analyzed for several different chemical constituents, including Title 22 metals, volatile organic compounds (“VOCs”), semi-volatile organic compounds (“SVOCs”), total petroleum hydrocarbons quantified as diesel (“TPHd”), TPH quantified as motor oil (“TPHmo”), polychlorinated biphenyls (“PCBs”), and dioxin-like compounds. No metals, VOCs, SVOCs, TPHd, TPHmo, or PCBs were detected at concentrations greater than Remediation Goals in these seventeen samples. Dioxin-like compounds are discussed below in Section 4.1.2.

To augment the available in-situ data collected during previous investigations, the Contractor will collect and analyze one composite soil sample per 600 cubic yards of stockpiled Overburden. Given the estimate of 8,000 cubic yards of Overburden with the Base Case Excavation, the combined frequency of the in-situ sampling and proposed stockpile sampling is approximately one sample per 260 cubic yards.

The composite sample of Overburden will be comprised of three discrete samples, one each from three separate 200 cubic yard stockpiles or stockpile segments. If needed, the Client Representative may also request that the Contractor analyze each discrete sample used to form the composite sample, or additional representative samples, to determine if each individual 200 cubic yard stockpile of Overburden is acceptable or unacceptable for reuse as backfill in the excavation. Overburden with the potential for reuse will be evaluated in accordance with Section 7.4.2 of the RMP, DTSC’s letter entitled *Soil Reuse, Former Oakland Army Base – EDC Area, Oakland California*, dated 24 December 2004, and COC concentrations may not exceed remediation goals established

in the RAP and land disposal restrictions and should not exceed the California hazardous waste criteria.

4.1.2 Sampling for Dioxin-like Compounds

A total of five Overburden samples were analyzed for dioxin-like compounds by the Army and OBRA (Table 2). Of the five samples tested for dioxin-like compounds, only one sample was found to contain dioxin-like compounds at concentrations that exceed the Remediation Goal of 0.1 micrograms per kilogram (“µg/kg”) calculated in the RAP / RMP for 2,3,7,8-tetrachlorodibenzo-p-dioxin (“2,3,7,8-TCDD”). 1,2,3,7,8-pentachlorodibenzo-p-dioxin (“1,2,3,7,8-PeCDD”), a dioxin congener that exhibits one-half the toxicity of 2,3,7,8-TCDD (the oral and inhalation slope factors for 1,2,3,7,8-PeCDD adopted by the State of California, Office of Environmental Health Hazard Assessment (“OEHHA”) are one-half the corresponding slope factors for 2,3,7,8-TCDD), was detected in Overburden sample Comp No. 4 (Table 2) at a concentration of 1.9 µg/kg. Sample Comp No. 4 was a two-point composite sample formed from two discrete Overburden samples collected from test trenches OBRA-T08 and OBRA-T10; the discrete Overburden samples were collected at 3 ft bgs at locations within the limits of the Base Case Excavation and just above the Organic Residue (See Figure 3). Other dioxin-like compounds, i.e., less toxic dioxin and furan congeners, were detected in trace concentrations in an Overburden sample collected by the Army from boring IT9S60 but at concentrations that were well below the 2,3,7,8-TCDD Remediation Goal and well below or within the range of “urban background” concentrations presented in Table 3-9 of The document entitled *Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds, Part I; Estimating Exposure to Dioxin-Like Compounds, Volume 3: Properties, Environmental levels and Background Exposures, Draft Final* (U.S. EPA, 2000). Urban background concentrations presented in this document were based on studies of Canadian soil, in which soil samples were collected from locations near an incinerator, in urban area soil samples, and in rural area soil samples and analyzed for a broad list of dioxin-like compounds.

Dioxin-like compounds, which may exhibit dioxin-like toxicity, in Overburden soil samples have generally been either not detected, or detected at trace concentrations below or within urban background ranges. Therefore, the one detection of a dioxin-like compound above Remediation Goals out of 5 Overburden samples are not believed to be indicative of significant contamination of the Overburden at the Site by dioxin-like compounds and should not preclude the reuse of Overburden soil at the Site. These available data do indicate that Overburden stockpiles should be tested for dioxin-like compounds prior to reuse on-site as backfill to some extent, particularly where

Overburden may be in contact with Organic Residue. Therefore, it is planned that approximately 15 composite Overburden samples collected as described in Section 4.1.1, will be tested for dioxin-like compounds. The composite samples to be tested for dioxin-like compounds will be chosen by the Contractor in consultation with the Client Representative to target Overburden that is most likely to contain dioxin-like compounds based on previous data, e.g., Overburden excavated near trenches OBRA-T08 and OBRA-T10 and locations where in-situ dioxin data are less frequent and spaced farther apart, e.g., sub-areas B, C, F, and G, or field observations of staining, odors, or mixing of Organic Residue within excavated Overburden.

4.2 CHEMICAL ANALYSIS

Composite samples of Overburden will be collected by the Contractor as described above in Section 4.1.1 and Section 4.1.2 above, and will be analyzed for the following:

- Title 22 Metals by U.S. EPA Method 6020;
- Selected SVOCs by U.S. EPA Method 8270C¹;
- Selected VOCs by U.S. EPA Method 8260B²;
- TPHd and TPHmo by U.S. EPA Method 8015M, with silica gel cleanup;
- PCBs U.S. EPA Method 8082A; and
- Dioxins and Furans by U.S. EPA Method 8290.

¹ The selected SVOCs for chemical analysis will include only those SVOCs that were identified in the RAP / RMP as COCs at the Former ORP / Building 1 Site. These SVOCs include: acenaphthene, acenaphthylene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-c,d)pyrene, naphthalene, phenanthrene, and pyrene.

² Discrete samples for VOC analysis will be collected using EnCore™ samplers by U.S. EPA Method 5035. The EnCore™ samplers will be frozen by the laboratory upon receiving the samples such that the hold time for VOCs is 5 days. The selected VOCs for chemical analysis will include only those VOCs that were identified in the RAP / RMP as COCs at the Former ORP / Building 1 Site. These VOCs include: 1,2,3-trichloropropane, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,2-dichloropropane, acetone, benzene, carbon disulfide, carbon tetrachloride, cis-1,2-dichloroethene, ethylbenzene, isopropylbenzene (cumene), methylene chloride, methyl ethyl ketone (2-butanone), methyl isobutyl ketone, methyl tertiary butyl ether, n-propylbenzene, p-cymene (p-isopropyltoluene), sec-butylbenzene, tetrachloroethene, toluene, trichloroethene, vinyl chloride, and xylenes.

The Contractor will provide all analytical data from Overburden sampling to the Client Representative. Based on the analytical data provided by the Contractor, the Client Representative will determine if Overburden stockpiles are acceptable for reuse on-site, i.e., by determining that the representative COC concentrations are less than individual and Remediation Goals, cumulative risk goals, and land disposal restrictions in accordance with Section 7.5 of the RAP, Section 7.4.2 of the RMP, and DTSC's letter entitled *Soil Reuse, Former Oakland Army Base – EDC Area, Oakland California*, dated 24 December 2004. The Client Representative will provide notice of its determination within two working days of receiving the complete data set from the Contractor. If needed, individual Remediation Goals for dioxin-like compounds detected at the Site other than 2,3,7,8-TCDD will be calculated following the procedures described in Section 7 of the RAP, pursuant to Section 5.2 of the RMP.

If needed, based on the Client Representative's review of the above data, additional testing, such as TCLPs and Waste Extraction Tests ("WETs"), may be required to demonstrate that the stockpiled Overburden is not a Federal or State of California hazardous waste in accordance with the RAP / RMP requirements for backfill material.

In the event that the stockpiled Overburden is found to be unacceptable for reuse on-site, Overburden will be transported off-Site for disposal at an appropriately permitted waste disposal facility. The Contractor will be responsible for coordinating and determining all necessary and required additional characterization requirements with the selected disposal facility and for performing any and all additional landfill-required waste characterization to allow off-Site disposal in accordance with the prices provided in the Contractor's bid.

5. STAINED AND OILY SOIL SAMPLING

In-situ analytical data collected previously by OBRA and the Army indicate that identified areas of Stained and Oily Soil contains TPHd, TPHmo, and lead, along with a few VOCs and SVOCs, at concentrations greater than Remediation Goals (Table 4). These identified areas of Stained and Oily Soil found with COC concentrations greater than Remediation Goals are generally located adjacent to and south of the area of Organic Residue as shown on Figure 3, and are within the limits of the Base Case Excavation as shown on Figure 3, unless additional excavation is directed by Client Representative. Stained and Oily Soil that was found in prior investigations to have COC concentrations less than Remediation Goals is not included within the limits of the Base Case Excavation, except to the extent that pockets of relatively less contaminated or unimpacted soil may be encompassed by soil found to exceed Remediation Goals. Regarding the latter less contaminated or unimpacted soil, if encountered during the Base Case Excavation, the Client Representative can direct the Contractor to segregate and separately stockpile such soil for evaluation for on-site reuse as backfill following testing protocols for Overburden soil, as discussed below.

Additional sampling and characterization beyond the available in-situ environmental data will be necessary for proper disposal of Stained and Oily Soil at off-Site permitted facilities, or possible reuse. At a minimum, chemical analyses of Stained and Oily Soil samples, for determination of off-site disposal classification, will consist of the following:

- Title 22 Metals by U.S. EPA Method 6020;
- TPHd and TPHmo by U.S. EPA Method 8015M, with silica gel cleanup;
- Lead by U.S. EPA Method 6020 in TCLP extract using TCLP Method 1311 provided in SW-846; and
- Lead by U.S. EPA Method 6020 in Waste Extraction Test (“WET”) extract.

If needed, based on the Client Representative’s review of the above data, additional testing may be required to demonstrate that the Stained and Oily Soil is not a Federal or State of California hazardous waste in accordance with the RAP / RMP requirements for backfill material.

However, the additional waste sampling protocols necessary for proper completion of required waste profile forms to obtain waste acceptance will be determined by the Contractor in accordance with the facility specific waste-profiling requirements of the selected, permitted, OBRA-approved disposal facilities named in its Bid, and the characteristics of the Stained and Oily Soil. The Contractor will be responsible for coordinating with the selected disposal facility and implementing all necessary and required sampling for waste disposal characterization in accordance with the prices provided in Contractor's bid. These data and completed forms will be provided to the Client Representative for review and approval prior to off-site disposal.

The initial analyses may indicate that a Stained and Oily Soil stockpile or other segregated, less impacted soil is determined to not require disposal at an off-site, permitted disposal facility and is potentially acceptable for reuse on-site, e.g., based on the initial comparison of total metal and TPH concentrations to their respective Remediation Goals. Then the Client Representative will request the Contractor to perform any additionally required sampling and analysis of the Stained and Oily Soil stockpile or other segregated, less impacted soil in accordance with the soil reuse requirements described in Section 4 of this SAP for confirmation of Overburden soil for reuse as backfill material at the Site. In accordance with Section 7.4.2 of the RMP, excavated Stained and Oily Soil or other segregated soil can be reused as backfill material if it meets Remediation Goals and is not a hazardous waste (per DTSC's letter entitled *Soil Reuse, Former Oakland Army Base – EDC Area, Oakland California*, dated 24 December 2004). Additionally, only Stained and Oily Soil found to be suitable material in accordance with the geotechnical requirements provided in the Contract Documents will be used as backfill for the excavation.

6. CONFIRMATION SOIL SAMPLING FROM EXCAVATION SIDEWALLS

Upon completion of the base case excavation shown in the Contract Documents or as otherwise requested by the Client Representative, the Contractor will collect soil confirmation soil samples along the sidewalls of the excavation to verify that residual COC concentrations meet the individual Remediation Goals for COCs, as well as cumulative hazard index (“HI”) and carcinogenic risk goals identified in the RAP / RMP (EKI, 2002a). The Contractor will provide the analytical data to the Client Representative, who will then determine whether individual Remediation Goals have been met for individual COCs at a particular sidewall location. The Client Representative will also calculate the cumulative HI and carcinogenic risks associated with residual COCs in soil for any given excavation area or location, in accordance with Section 7.5 of the RAP.

Additional soil excavation may be necessary to achieve individual Remediation Goals, cumulative HIs of no greater than 1, and cumulative carcinogenic risks of no greater than 10^{-5} consistent with the RAP / RMP. This information will be utilized by the Client Representative to determine if additional excavation is necessary at any sidewall location. If additional excavation is needed, the Client Representative will inform the Contractor in accordance with the Contract Documents.

6.1 SAMPLING FREQUENCY AND LOCATIONS

Once the initial extent of the base case excavation is reached, either as shown on the Construction Drawings or as directed by the Client Representative in the field, the Contractor will collect soil samples from the sidewalls of the excavation in accordance with the protocols described below. The protocols described below are consistent with RMP protocols as described in Section 7.4.1 of the RMP, except as modified below to account for Site-specific conditions:

- The Contractor will collect confirmation soil samples from the freshly exposed sidewalls of the excavation at a depth of approximately 6-inches above standing water in the excavation, which is expected to be at a depth of approximately 4 to 5 feet below ground surface (“bgs”). This depth corresponds to the approximate interval where Organic Residue and Stained and Oily Soil are present in the subsurface, as indicated by available Site characterization data. If directed by the Client Representative, the Contractor will modify the sample collection depth in

the field to target any visually contaminated layers encountered along the sidewalls of the excavation.

- The Contractor will collect approximately equally-spaced confirmation soil samples at an interval of no less than one discrete sample per 25 linear feet along the sidewall of the excavation face. Composite soil samples from excavation sidewalls will not be allowed for any environmental analyses required by this SAP.
- If a sidewall face is less than 25 linear feet, one discrete confirmation soil sample will be collected at the approximate center point along the length of the sidewall.
- If the Client Representative identifies extensive heterogeneous lithological conditions, observable contaminated layers (visually or by use of an organic vapor meter or other direct-reading instrument), or debris along the excavation sidewall, the Contractor will be required to collect additional sidewall samples at the direction of the Client Representative. In accordance with the Contract Documents, the Contractor will notify the Client Representative whenever such conditions are encountered in the excavation and will allow inspection by the Client Representative to make a determination of the need for additional sampling.
- The Contractor will measure the locations of sidewall soil samples from known, topographically surveyed points, bench marks, or permanent Site improvements, and the Contractor will sketch the sample locations onto field maps with appropriate sample identifications and retain such information in its daily field logs for reference. Daily field logs including such information on sample locations will be provided by Contractor to the Client Representative in accordance with the Contract Documents.
- If possible, the Contractor will collect confirmation soil samples from the freshly exposed bottom of the excavation at a depth of approximately 6-inches above standing water in the excavation, which is expected to be at a depth of approximately 4 to 5 feet bgs (a similar depth to the sidewall confirmation samples). The number of bottom samples will be determined in consultation with DTSC, and samples will be collected only in locations where groundwater has not covered the excavation bottom. The target bottom sample area will be from areas where prior in-situ data are less frequent and spaced farther apart than other areas of the excavation.

6.2 CHEMICAL ANALYSES

The first phase of chemical analyses of confirmation soil samples to be conducted by the Contractor on a rush basis, i.e., 24-hour turn-around time, will consist of the following:

- Lead by U.S. EPA Method 6020; and
- TPHd and TPHmo by U.S. EPA Method 8015M, with silica gel cleanup.

Based on the results of the first phase of chemical analysis, the Client Representative will determine whether additional excavation is necessary along a particular sidewall. Once the Client Representative determines that no additional excavation is necessary based on the lead, TPHmo, and TPHd data, in accordance with the Contract Documents, then the Contractor will perform the additional chemical analyses described below to verify compliance with the Remediation Goals as discussed in Section 2 above.

For determining compliance with cumulative HIs and carcinogenic risk goals, the Contractor will perform a second phase of chemical analysis on approximately 50% of the confirmation soil sidewall samples collected from the final extent of the excavation. Cumulative HIs and carcinogenic risks will be calculated by the Client Representative using the protocols described in Section 7.5 of the RAP, which require Representative Concentrations (“RCs”) for all COCs detected in soil at a RAP Site. The Contractor will choose the samples for the second phase of laboratory analyses in consultation with the Client Representative, in accordance with the Contract Documents, such that the frequency of confirmation samples analyzed for the additional chemical constituents is approximately one discrete sample per 50 linear feet of sidewall along the final extent of the excavation. These sidewall soil confirmation samples will be analyzed by the following U.S. EPA analytical methods:

- Title 22 metals by U.S. EPA Method 6020;
- Selected SVOCs by U.S. EPA Method 8270C³;
- Selected VOCs by U.S. EPA Method 8260B⁴.

³ The selected SVOCs for chemical analysis will include only those SVOCs that were identified in the RAP / RMP as COCs at the Former ORP / Building 1 Site (see footnote 1)

The first and second phase of analytical results will be reported on a wet-weight, as received, basis. If any results are provided on a dry-weight basis, the Contractor will notify the Client Representative in advance of performance of such analyses in accordance with the Contract Documents. The Contractor will keep copies of confirmation soil sampling results on-site in its field office for review by the Client Representative upon request.

6.3 OBSERVATIONS AND REVIEW OF DATA BY DTSC

Prior to backfilling the excavation, the Contractor will notify the Client Representative in accordance with the Contract Documents that the excavation is ready to be backfilled. The Client Representative will in turn contact DTSC representatives to observe the excavation and review confirmation soil sample data prior to backfilling. Once the Contractor notifies the Client Representative that excavation is complete and all certified analytical laboratory reports are available for inspection, the Client Representative and DTSC will have three working days to complete their review and determine whether remediation is complete before the Contractor begins backfilling the excavation.

⁴ Discrete samples for VOC analysis will be collected using EnCore™ samplers by U.S. EPA Method 5035. The EnCore™ samplers will be frozen by the laboratory upon receiving the samples such that the hold time for VOCs is 5 days. The selected VOCs for chemical analysis will include only those VOCs that were identified in the RAP / RMP as COCs at the Former ORP / Building 1 Site (see footnote 2).

7. IMPORT FILL SAMPLING

At least 3 weeks prior to bringing import fill materials on-site, the Contractor will provide documentation to the Client Representative designating the source of the fill material and describing the previous land uses at the source of the fill, whether an environmental Site assessment was performed and its findings, and the results of any previous testing (environmental and geotechnical) performed by others. The Contractor will prepare and submit an Imported Backfill Information Report and an Imported Materials Certification Form. The Contractor must receive a written notice of acceptance of the proposed fill material from the Client Representative prior to bringing the import fill materials on-site.

The Contractor will arrange for access to any proposed fill source material for any geotechnical sampling that is required by OBRA's geotechnical or civil engineer for use in determining the suitability of the fill material and for performance of any specified tests, e.g., compaction testing, in conformance with "suitable fill material" specifications in the Contract Documents, or any permit requirements.

7.1 SAMPLING FREQUENCY

A sample will be required for each separate source of import fill; a single discrete sample will be collected if the source is a quarry and composite sample will be collected if the source is an offsite borrow source that is a stockpile or is accessible from multiple points around the pile. The composite sample shall consist of five discrete soil samples to be composited in the laboratory.

7.2 CHEMICAL ANALYSIS

Composite samples of import fill soil will be collected by the Contractor as described above in Section 7.1 and will be analyzed for the following:

- Title 22 Metals by U.S. EPA Method 6020;
- SVOCs by U.S. EPA Method 8270C;
- TPHg and TPHd by U.S. EPA Method 8015M, with silica gel cleanup; and
- PCBs and organochlorine pesticides U.S. EPA Method 8081A, 8082.

VOC analysis by U.S. EPA Method 8260B will be conducted on 2 of the 5 discrete import fill samples prior to compositing.

If virgin quarry run rock is provided directly from a quarry, the Client Representative may waive the analyses for organic compounds. The Contractor will provide all analytical data from import fill soil sampling to the Client Representative. Based on the analytical data provided by the Contractor, the Client Representative will determine if import fill is acceptable for use on-site, i.e., by determining that the representative COC concentrations are less than individual and Remediation Goals and cumulative risk goals in accordance with Section 7.5 of the RAP. The Client Representative will provide notice of its determination within two working days of receiving the complete data set from the Contractor.

In the event that import fill brought onto the Site is found to be unacceptable for use on-site, the Contractor will be responsible for removing all unacceptable fill material and collecting verification samples to show that such material has been removed and disposed in accordance with laws and regulations. The Contractor will be responsible for coordinating and determining all necessary and required additional characterization requirements with the selected disposal facility and for performing any and all additional landfill-required waste characterization.

8. ADDITIONAL DISPOSAL SAMPLING

Additional sampling and characterization may be necessary for proper disposal of debris material or water generated at the Site. Debris material will likely be generated that is not designated as Building 1 Remediation Waste, Stained and Oily Soil, or Overburden. Such material could include former Building 1 foundation support piles, concrete and asphalt debris, or wood, concrete, and metal debris encountered in the subsurface. Water generated at the site could include water that drains from soils excavated from below the groundwater table, storm water that falls or runs onto the stockpile or treatment areas, the Contractor's wet decontamination activities, or other water-generating activities. Both the debris and water will be disposed as wastes.

In accordance with the RMP, prior to disposal water samples will be analyzed for the following:

- pH by U.S. EPA Method 9045;
- Title 22 Metals by U.S. EPA Method 6020;
- SVOCs by U.S. EPA Method 8270C;
- VOCs by U.S. EPA Method 8260B;
- TPHg and TPHd by U.S. EPA Method 8015M, with silica gel cleanup; and
- PCBs and organochlorine pesticides U.S. EPA Method 8081A, 8082.

Waste sampling protocols necessary for proper completion of required waste profile forms to obtain waste acceptance will be determined by the Contractor, and provided to the Client Representative for review and concurrence, in accordance with the facility specific waste-profiling requirements of the selected, permitted, OBRA-approved disposal facilities, and the characteristics of the wastes encountered. The Contractor will be responsible for coordinating with the selected disposal facility, and implementing the necessary and required sampling for waste disposal characterization in accordance with the prices provided in the Contractor's bid.